

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An optical device comprising:

a plurality of separate optical paths, each of which receiving one or more separate optical signals in a respective band;

a plurality of optical power monitors, each of which being configured to ~~sense~~ measure a respective ~~total-signal~~ spectral band power on an associated one of said separate optical paths; and

a plurality of idler lasers, each of which being configured to provide a compensating wavelength for injection into an associated one of said optical signal paths downstream from where an associated one of said optical power monitors sense and in response to an associated ~~total-signal-power-sensed~~ spectral band power measured by an associated one of said optical power monitors to control optical power transients,

wherein each said compensating wavelengths is provided at a power level sufficient for compensating for signal power changes for each respective band on said associated one of said optical signal paths,

wherein the power level of each idler laser is controlled according to the respective spectral band power on the associated one of said separate optical paths as measured by the associated one of said optical power monitors.

2. (Cancelled)

3. (Original) An optical device according to claim 1, wherein said device further comprises a demultiplexer having a plurality of outputs, each of said separate optical paths being coupled to an associated one of said outputs for receiving said one or more separate optical signals.

4. (Original) An optical device according to claim 1, wherein said device further comprises a multiplexer having a plurality of inputs, each of a plurality of said optical paths being coupled to an associated one of said optical inputs, said multiplexer providing an output comprising said one or more separate optical signals on each of said plurality of optical paths.

5. (Original) An optical device according to claim 1, wherein said device further comprises a plurality of data modulators, each of which being configured to modulate data on an associated one of said compensating wavelengths.

6. (Currently Amended) An optical device according to claim 1, wherein said device further comprises a plurality of detectors, each of which being coupled to an associated one of said optical power monitors for generating a respective fault alarm in

response to an ~~associated total signal~~ a respective spectral band power sensed by said associated one of said optical power monitors.

7. (Currently Amended) An optical device comprising:

a demultiplexer having a plurality of outputs,

a plurality of separate optical paths, each of which being coupled to a respective one of said plurality of outputs for receiving one or more separate optical signals;

a plurality of optical power monitors, each of which being configured to ~~a sense~~ measure a respective ~~total signal~~ spectral band power on an associated one of said separate optical paths;

a plurality of idler lasers, each of which being configured to provide a compensating wavelength for injection into an associated one of said optical paths downstream from where an associated one of said optical power monitors ~~sense~~ measure and in response to an associated ~~total signal power sensed~~ spectral band power measured by an associated one of said optical power monitors, each of said compensating ~~wavelength~~ wavelengths being at a power level for ~~maintaining a substantially constant optical signal power~~ compensating for signal power changes for each respective band on said associated one of said optical signal paths to control optical power transients,

wherein the power level of each idler laser is controlled according to the respective spectral band power on the associated one of said separate optical paths as measured by the associated one of said optical power monitors; and

a multiplexer having a plurality of inputs, each of a plurality of said optical paths being coupled to an associated one of said optical inputs, said multiplexer providing an output comprising said one or more separate optical signals on each of said plurality of optical paths.

8. (Original) An optical device according to claim 1, wherein said device further comprises a plurality of data modulators, each of which being configured to modulate data on an associated one of said compensating wavelengths.

9. (Currently Amended) An optical device according to claim 1, wherein said device further comprises a plurality of detectors, each of which being coupled to an associated one of said optical power monitors for generating a respective fault alarm in response to an associated total signal power sensed a respective spectral band power measured by said associated one of said optical power monitors.

10. (Currently Amended) A method of controlling optical power transients in an optical communication network including an aggregate optical signal comprising a plurality of separate optical signals, said method comprising:

providing a plurality of separate optical signal paths, each of said signal paths carrying at least one of said separate optical signals in a respective band;

detecting a spectral band power level associated with said at least one of said separate optical signals on each of said separate optical signal paths; and

injecting a separate compensating wavelength into each of said optical signal paths at a location downstream from where the associated ~~power level~~ spectral band power is detected and in response to an associated power level detected thereon in said detecting step to control optical power transients,

wherein the power level of each compensating wavelength is controlled according to the respective spectral band power on the associated one of said separate optical paths as detected by said detecting step.

11. (Currently Amended) A method of controlling optical power transients in an optical communication network including an aggregate signal comprising a plurality of separate signals, said method comprising:

separating said aggregate signal onto a plurality of separate signal paths, each of said signal paths carrying a separate group of said separate signals in a respective band;

detecting a spectral band power level associated with each of a plurality of said separate groups of separate signals on associated separate optical signal paths;

injecting a separate compensating wavelength into each of said associated optical signal paths at a location downstream from where the associated spectral band power level is detected and in response to an associated power level detected thereon in said detecting step; ~~and~~

controlling a power level of each compensating wavelength according to the respective spectral band power detected for the associated band of separate signals on the associated separate optical signal path; and

combining each of said plurality of said separate groups of optical signals on an aggregate optical signal path.

12. (Currently Amended) An apparatus for reducing the effects of transients in an optical communications node having a plurality of separate paths each carrying a corresponding band of data wavelengths, the apparatus comprising:

optical power monitors each of which is optically coupled to one of the separate paths, said optical power monitor monitoring an

~~optical power level~~ a spectral band power of the corresponding band of data wavelengths being carried by the path being monitored;

idler lasers each of which is optically coupled to one of the separate paths at a location downstream from the respective optical power monitor; and

a control circuit operatively coupled to said optical power monitors and to said idler lasers, said control circuit providing feedforward control of said idler lasers based on the respective ~~optical~~ spectral band power level of the corresponding band of data wavelengths,

said control circuit providing feedforward control of said idler lasers based on the respective spectral band power of the corresponding band of data wavelengths and to maintain a desired and substantially constant spectral band power for each of the corresponding bands of data wavelengths.

13. (Cancelled)

14. (Currently Amended) The apparatus according to claim 13, wherein the desired constant spectral band power is different for at least two of the bands of data wavelengths.

15. (Currently Amended) The apparatus according to claim 12, said control circuit providing feedforward control of said idler lasers according to

$$P_M + P_i = P_d$$

where  $P_M$  is the measured ~~optical power level~~ spectral band power of the corresponding band measured by a respective one of said optical power monitors,

$P_i$  is an optical power level of the compensating wavelength output by the corresponding idler laser, and

$P_d$  is a desired ~~optical power level~~ spectral band power for the corresponding desired band power.

16. (Previously Presented) The apparatus according to claim 12, further comprising:

a demultiplexer optically coupled to the plurality of separate paths, said demultiplexer receiving an aggregate signal, demultiplexing the aggregate signal into the bands of data wavelengths, and outputting the bands of data wavelengths into respective ones of the separate paths.

17. (Previously Presented) The apparatus according to claim 16, each of said idler lasers injecting an optical signal at a wavelength different than the data wavelengths of the corresponding band and within a corresponding passband of the demultiplexers.



18. (Previously Presented) The apparatus according to claim 12, further comprising:

a calibrated length of optical fiber being provided, for each of the separate paths, between the locations at which the optical power monitor and the idler laser are optically coupled to a respective one of the separate paths.